

The plate archive of the Argelander-Institut in Bonn

is a part of the "Sammlung Historischer Himmelsaufnahmen"

Michael Geffert

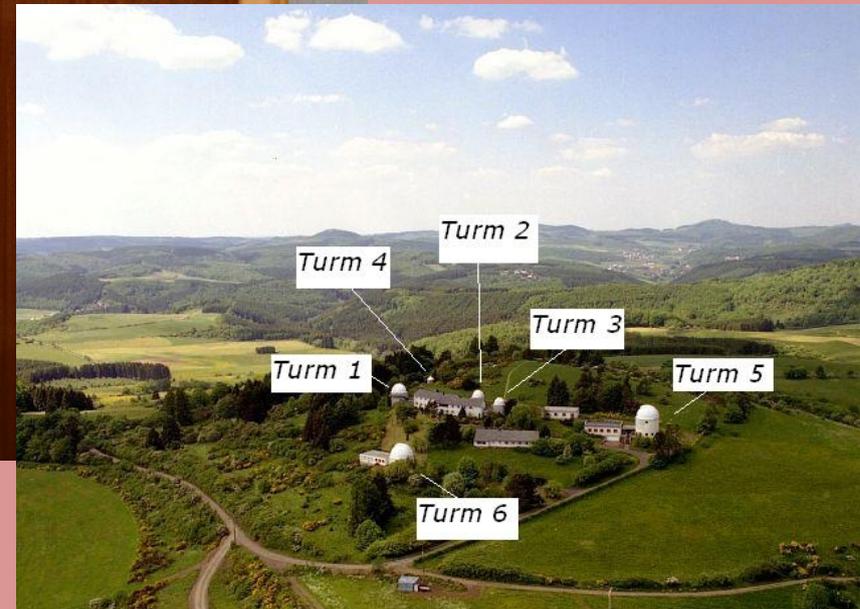


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From observatory
to plate archive...



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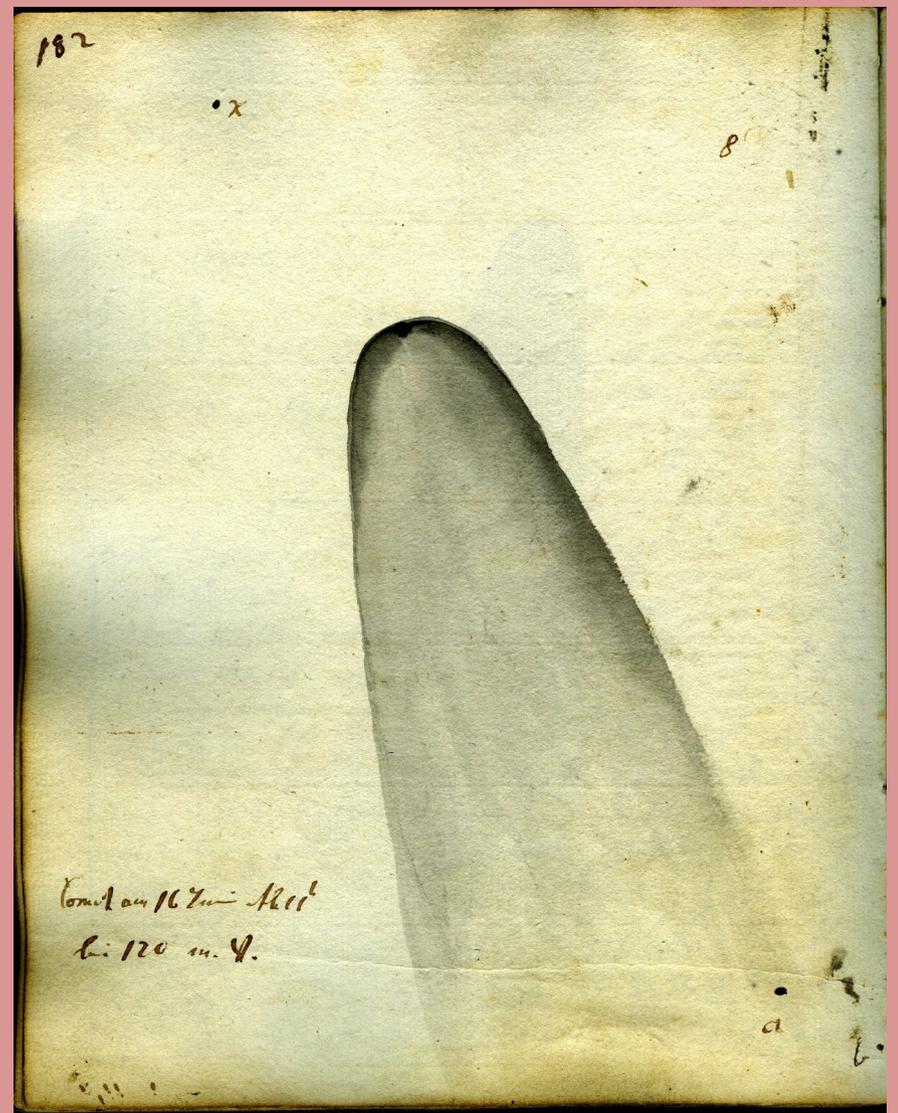
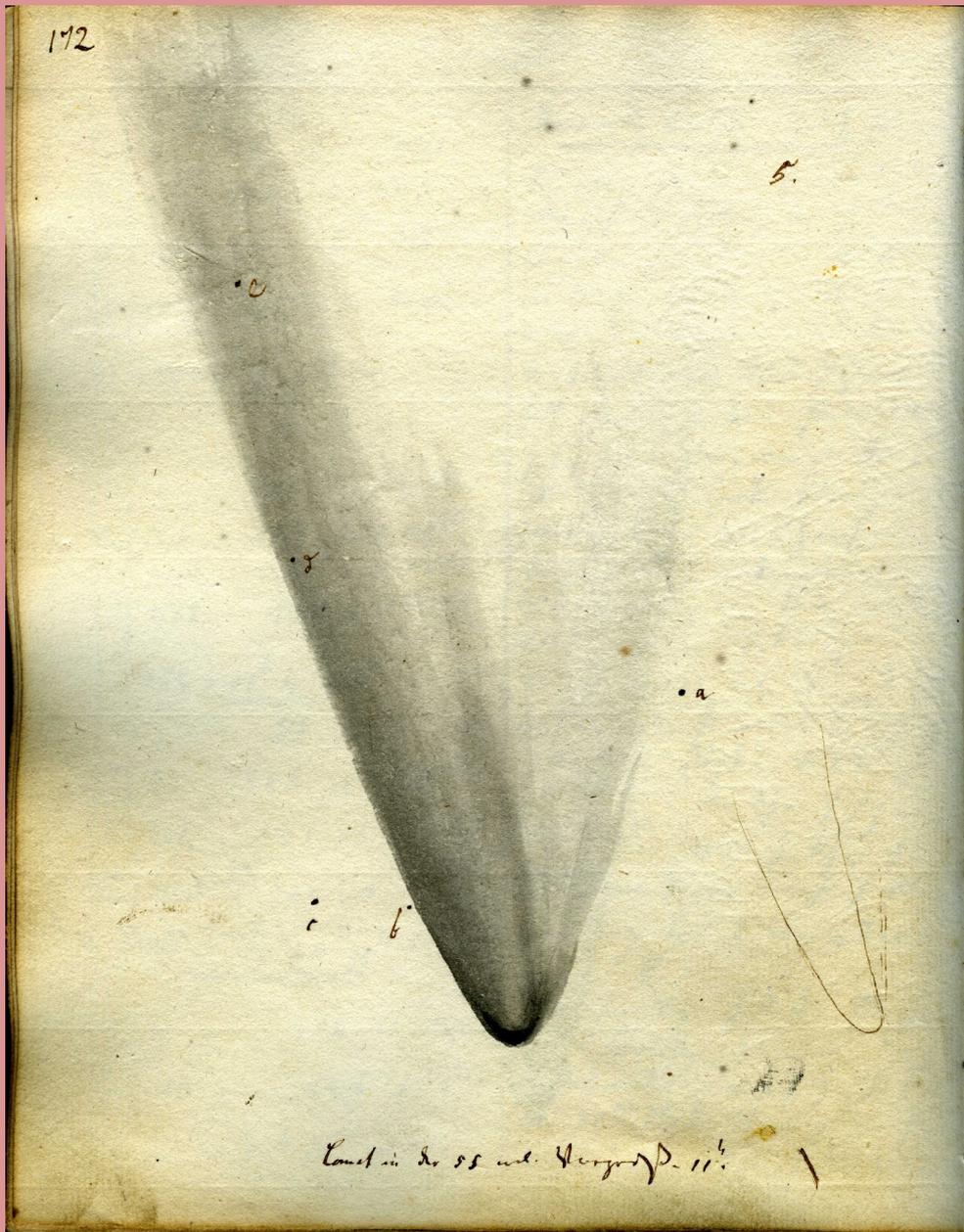


The "Beobachtungstagebücher" of Julius Schmidt (1825-1884)



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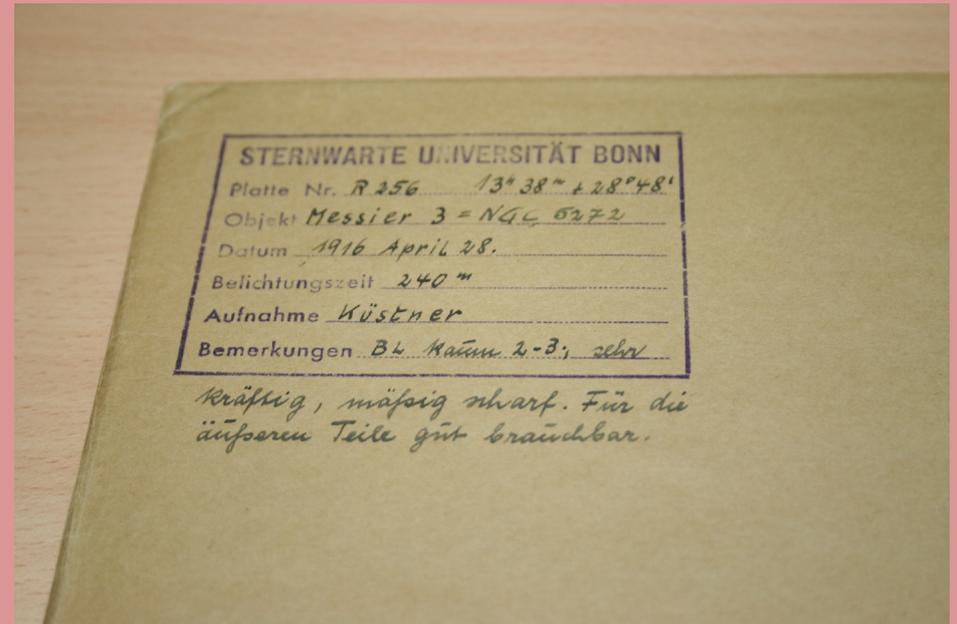


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Plates

- Observatorium Hoher List
- Bonner Doppelrefraktor
- Hainberg Astrograph
Göttingen
- ESO, Boyden, Bulgarien
- Spektren (Bonn, Hoher List, ESO)
- Single observatories,?



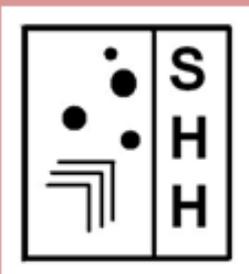
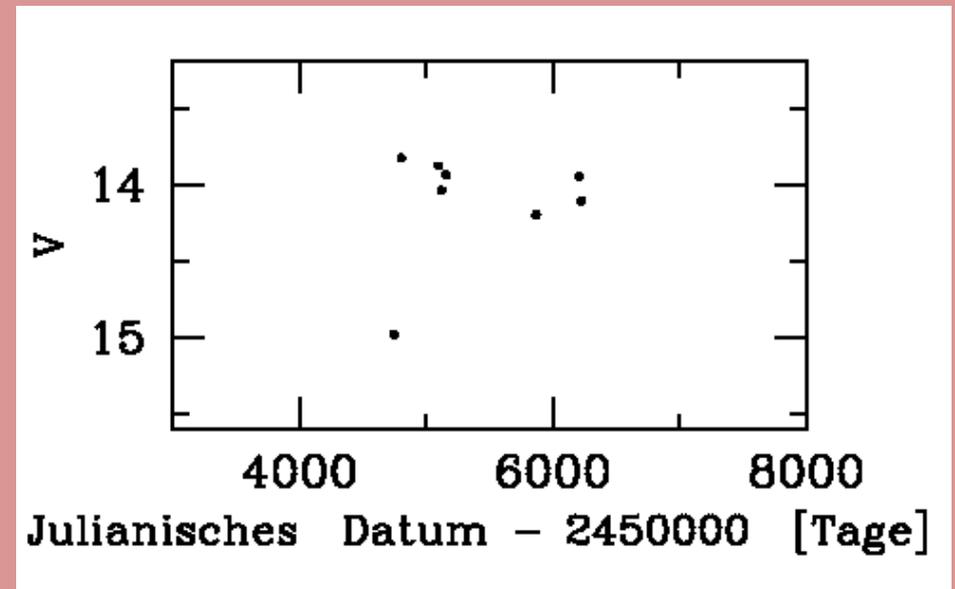
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- SCIENCE
- DIDACTIC/EDUCATION
- OUTREACH / ART PROJECTS
- PREPARATION OF THE DIGITIZATION

Students project => a new variable star in the Lacerta OB2 association (with P. Hauer/J. Dräger)

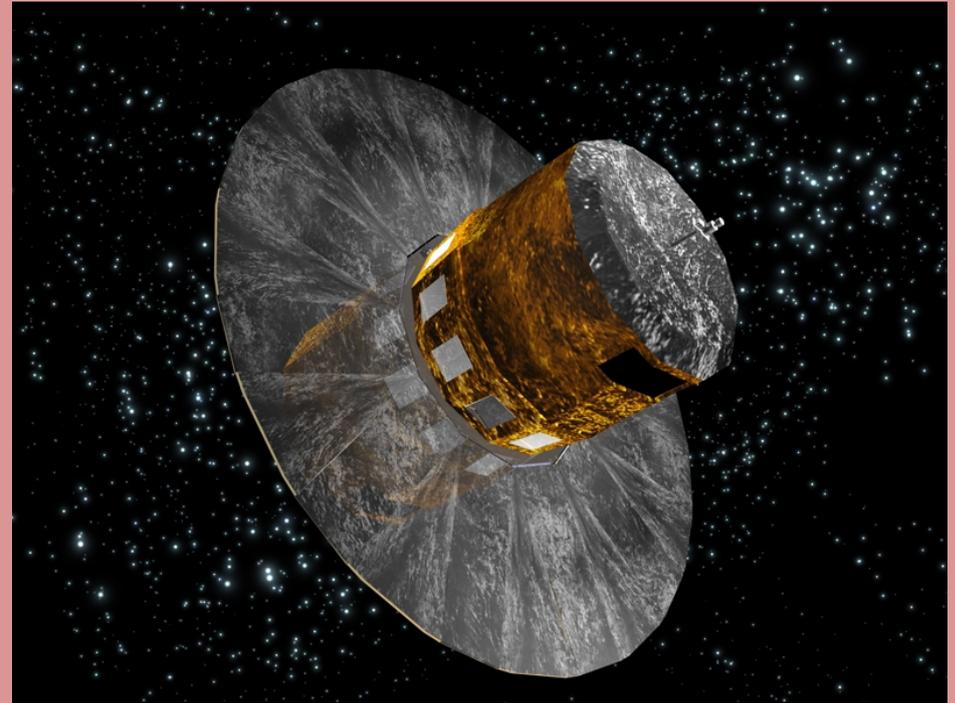
- 60 photographic plates of (D=30cm; f=1.5 m) astrograph of Hoher List
- scanned with a flatbed scanner
- light curves of variable stars, one new object found
- publication in the BAV Rundbrief 4 (2013) => follow-up observations by amateur astronomers



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Some astrometry

- Launch of the Gaia satellite Dec 2013
- Catalogue spring 2017
- Hipparcos 100.000 stars
1-2 mas/yr
- Tycho 2 2500000 stars
2-3 mas/yr
- Limiting magnitude 12.5



Rotation Curve of the Galaxy

Sofue et al. 2009

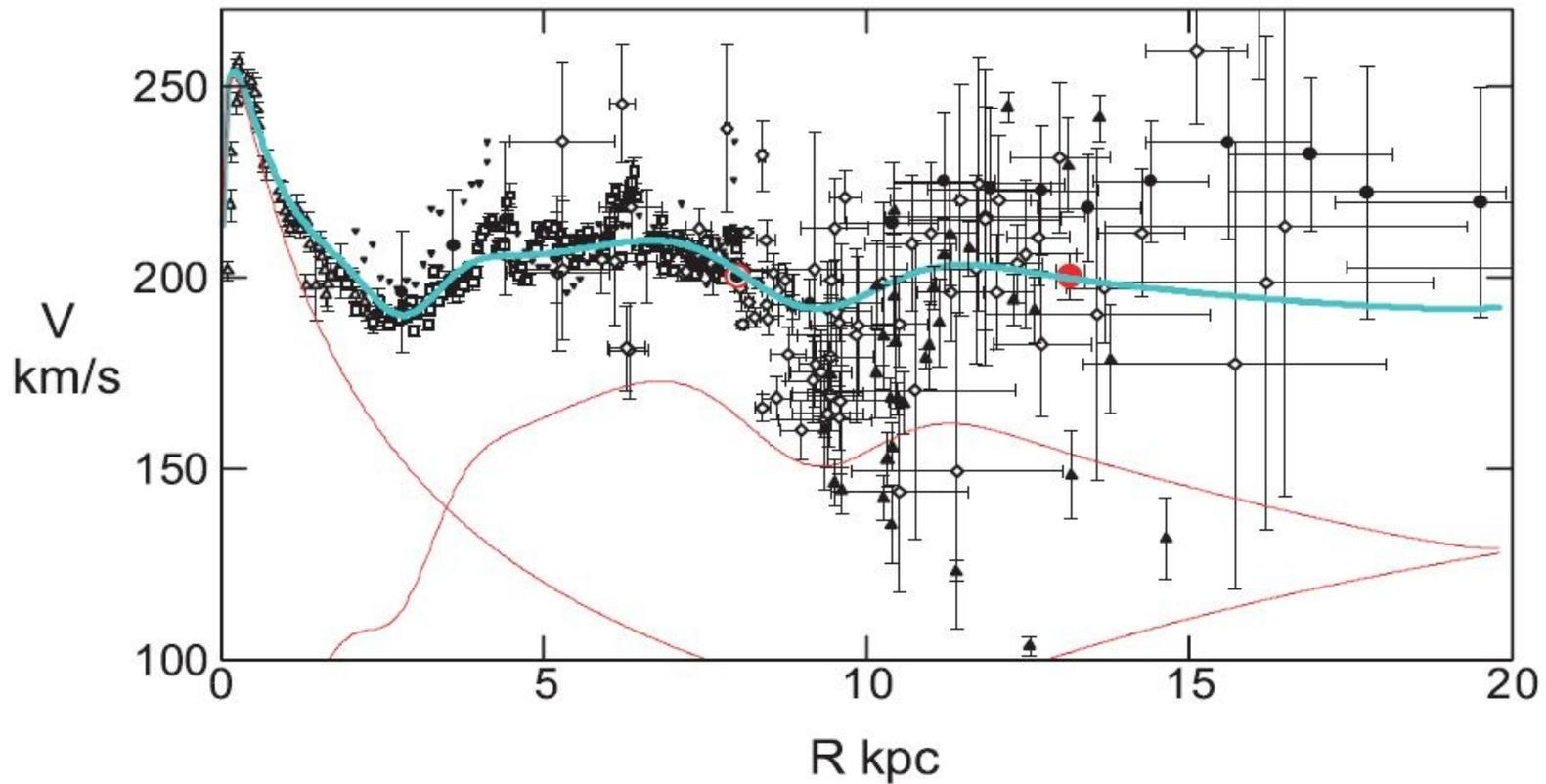


Fig. 4. Model rotation curve compared with the observations. Thin lines represent the bulge, disk + rings, and dark halo components, and the thick line is the composite rotation curve. Data are the same as in figure 1.

How to test the astrometric accuracy?

- comparison with independent catalogues (Tycho2, individual catalogues)
- internal errors
- for star clusters: looking for rms of the proper motion of cluster stars in the final result



Astrometric tests with Tycho 2

	$\Delta\alpha$ [arcsec]	$\Delta\delta$ [arcsec]	
NGC 2194	0.16	0.15	80* / 5 plates
NGC 6611	0.17	0.18	90* / 3 plates
NGC 6819	0.15	0.14	85* / 1 plate
NGC 7086	0.18	0.17	62* / 4 plates

plates from 1914 to 1930 / $\Rightarrow \sigma = 3 \text{ mas/yr}$



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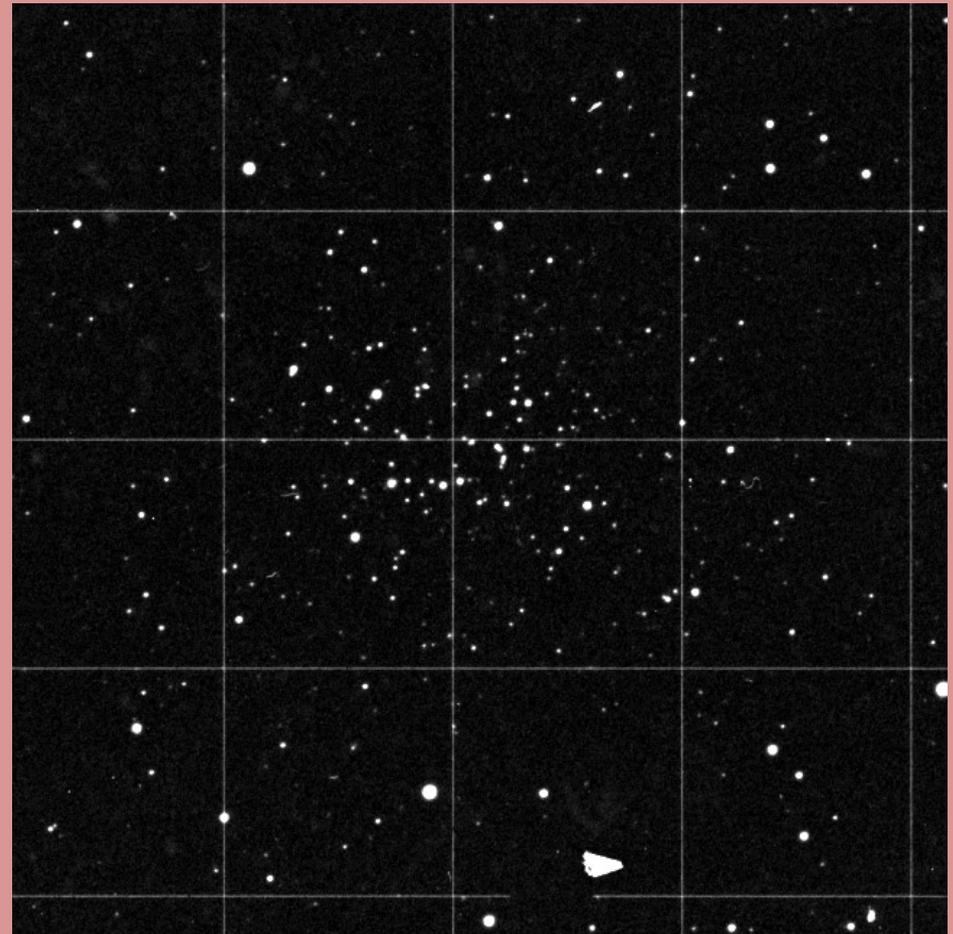
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NGC 2194

(together with Noah Sengenberger)

- Located in Orion
- $d = 3.8 \text{ kpc} / R = 11.5 \text{ kpc}$
- 300 Mill years old
- 5 plates from 1917/18
- area of $50' \times 50'$

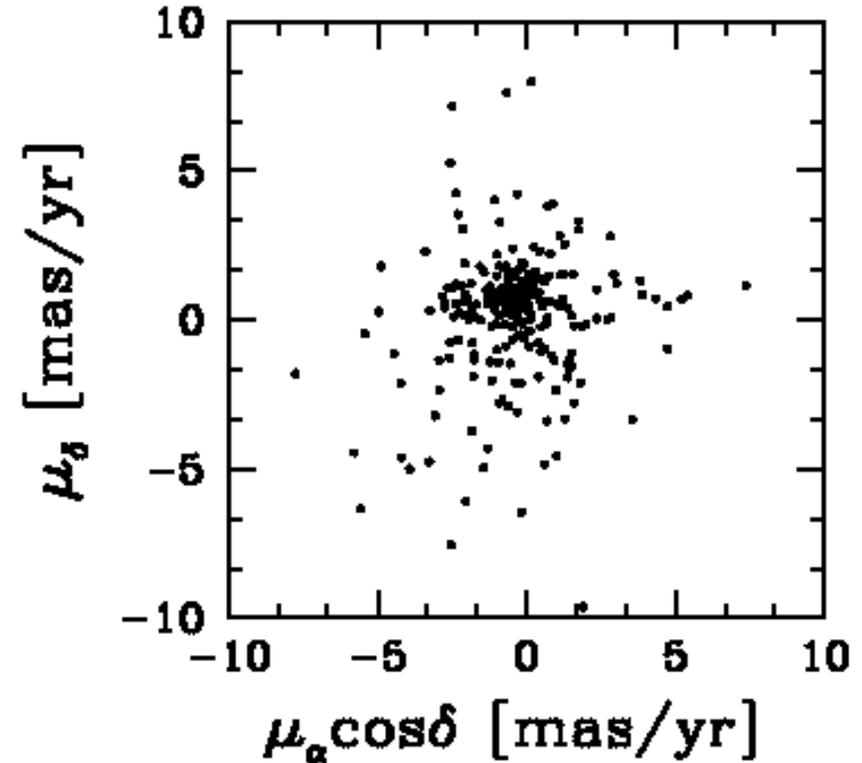
- Sanner et al. (2000)



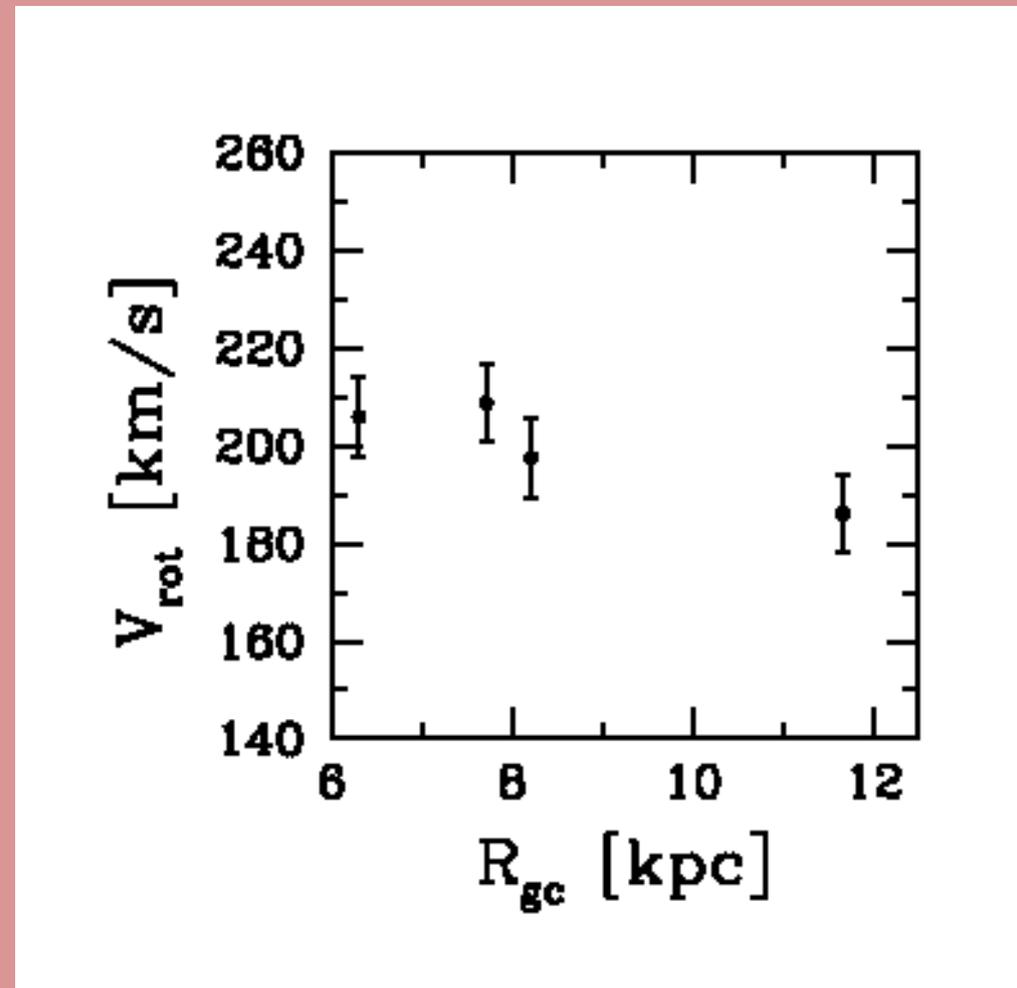
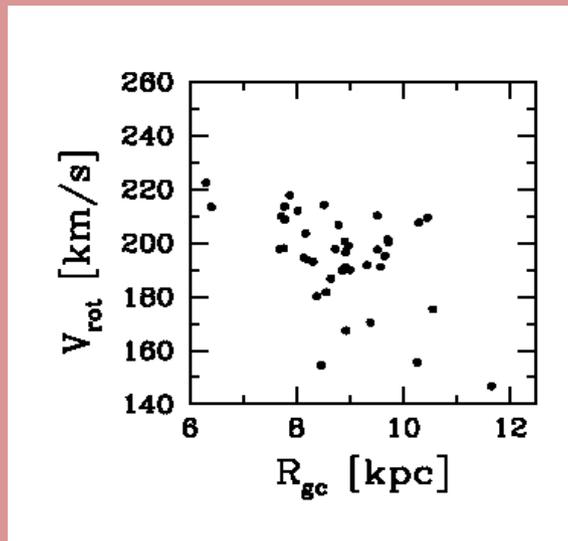
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Results

- High accuracy proper motions
- 209 cluster members,
 $\sigma_{\mu} = 1.3$ mas/yr (single)
- $\sigma_{\mu} = 0.3$ mas/yr (cluster)
- $e = 0.12$
- Between $R = 9.7$ and 12.4 kpc



The first "Bonner" Rotation Curve



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Art projects

- Interdisciplinary KISD
(Köln International School of Design)
Conference on
"Operative images",
Köln (May, 2013)
- Exhibition in Alfter
(November, 2013)
- Exhibition "Walzwerk
Pulheim" (March, 2015)



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